IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Re:	Application of:	Slater et al.
	Serial No.:	09/995,844
	Filed:	November 28, 2001
	For:	Utility Meter Using Temperature Compensation
	Group Art Unit:	2863
	Confirmation No.:	3190
	Examiner:	Aditya S. Bhat
	Our Docket:	1505-0106

APPEAL BRIEF

Sir:

This is an appeal under 37 CFR § 41.31 to the Board of Patent Appeals and Interferences of the United States Patent and Trademark Office from the rejection of claims 1-20 of the above-identified patent application. Claims 1-20 have been finally rejected in an office action dated August 26, 2009. Authorization to charge an amount of **$540.00** to deposit account 13-0014 is hereby provided. Also, please provide any extension of time which may be necessary and charge any fees which may be due to Deposit Account No. 13-0014, but not to include any payment of issue fees.

(1) REAL PARTY IN INTEREST

Landis+Gyr, Inc. is the owner of this patent application, and therefore the real party in interest.

(2) RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences in this case.

(3) STATUS OF CLAIMS

Claims 1-20 are pending in the application.

Claims 1-20 stand rejected and form the subject matter of this appeal. Claims 1-20 are shown in the Appendix attached to this Appeal Brief.

(4) STATUS OF AMENDMENTS

Applicants filed a Response to Office Action dated July 1, 2008 ("First Response") responsive to an Office Action dated April 1, 2008. A second Office Action dated October 27, 2008 was designated by the Examiner to be responsive to the First Response. On February 27, 2009, Applicants filed an ("Second Response") that was responsive to the October 27, 2008 Office Action. The Applicants filed a Response to Non-Compliant Amendment on May 13, 2009. The Examiner then issued a final Office Action dated August 28, 2009 ("Final Action").

(5) SUMMARY OF THE CLAIMED SUBJECT MATTER

Independent claim 1 is directed to an arrangement for adjusting a time keeping function of a utility meter. The arrangement includes at least one sensor and a processing circuit. In a non-limiting example, Fig. 1 of the application shows an arrangement that includes a sensor 58 and a processing circuit 54. (See specification at p.8, lines 6-9).

As claimed, at least one sensor is configured to detect a temperature at a location proximate a time keeping component. As shown in the example of Fig. 1, the sensor 58 is disposed such that it can detect a temperature at a location proximate a time keeping component 56. (See *id.* at lines 9-16). As claimed, the time keeping component generates timing signals at a rate that varies as a function of temperature. In the exemplary embodiment of Fig. 1, the time keeping component 56 generates timing signals that vary as a function of temperature. (See specification at p.9, line 22 to p.10, line 9).

As per claim 1, the sensor is further configured to generate an output signal representative of the detected temperature. (See specification at p.8, lines 17-19).

The processing circuit is configured to adjust at least one clock maintained by the time keeping function of the meter in dependence upon the output signal from the at least one sensor. In the exemplary embodiment of claim 1, the processing circuit 54 adjusts a clock maintained by the time keeping function of the meter based on the temperature detected by the temperature sensor 58. (See specification at p.8, lines 20-23).

Claim 7 is directed to an electricity meter that includes a source of commodity consumption information, at least one sensor, and a processing circuit. In the exemplary embodiment of Fig. 1, a meter 50 includes a commodity consumption information source 52, a temperature sensor 58, and a processing circuit 54. (See specification at p.6, lines 14-17 and p.8, lines 17-18).

As claimed, at least one sensor is configured to detect a temperature at a location proximate a time keeping component. As shown in the example of Fig. 1, the temperature sensor 58 is disposed such that it can detect a temperature at a location proximate a time

keeping component 56. (See specification at p.8, lines 9-16). As claimed, the time keeping component generates timing signals at a rate that varies as a function of temperature. In the exemplary embodiment of Fig. 1, the time keeping component 56 generates timing signals that vary as a function of temperature. (See *id.* at p.9, line 22 to p.10, line 9).

As per claim 7, the sensor is further configured to generate an output signal representative of the detected temperature. (See specification at p.8, lines 17-19).

The processing circuit is coupled to receive commodity consumption information from the source of commodity consumption information. In the exemplary embodiment of Fig. 1, the processing circuit 54 receives electricity consumption information from the source of commodity consumption information 52. (See specification at p.7, lines 9-15). As claimed, the processing circuit is configured to generate metering data based on the commodity consumption information and real time clock information, and adjust the real time clock information in dependence upon the output signal from the at least one sensor. In the exemplary embodiment of Fig. 1, the processing circuit 54 is configured to generate metering data based on the information from the source 56. (See *id.* at lines 16-17). In the exemplary embodiment of claim 1, the processing circuit 54 adjusts a clock maintained by the time keeping function of the meter based on the temperature detected by the temperature sensor 58. (See specification at p.8, lines 20-23).

Claim 19 is directed to a method for adjusting a time keeping function of a utility meter. The claimed method includes generating timing signals using a time keeping component that generates timing signals at a rate the varies as a function of temperature. In

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the exemplary embodiment of Fig. 1, the time keeping component 56 generates timing signals that vary as a function of temperature. (See *id.* at p.9, line 22 to p.10, line 9).

The claimed method also includes detecting a temperature at a location proximate to the time keeping component, and generating an output signal representative of the detected temperature. As shown in the example of Fig. 1, the temperature sensor 58 detects a temperature at a location proximate a time keeping component 56, and generates an output signal indicative thereof. (See specification at p.8, lines 9-18).

Finally, the method includes adjusting at least one clock maintained by the time keeping function of the meter in dependence upon the output signal. In the exemplary embodiment of claim 1, the processing circuit 54 adjusts a clock maintained by the time keeping function of the meter 50 based on the temperature detected by the temperature sensor 58. (See specification at p.8, lines 20-23).

(6) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1-20 are unpatentable under 35 U.S.C. § 103(a) by U.S. Patent No. 6,847,300 to Yee et al. ("Yee") in view of U.S. Patent No. 5,644,271 to Mollov et al. ("Mollov").

The claims do not stand or fall together.

(7) ARGUMENT

The Obviousness Rejections Over Yee and Mollov

The Examiner has not provided a legally sufficient motivation, suggest or *reason* to

combine Yee and Mollov as proposed in connection with each of the claims. Accordingly, appellants respectfully request reversal of the obviousness rejections of claims 1-20. The specific grounds for reversal differs for various claims, as will be discussed below. In some cases, such as in the cases of claims 4 and 7-18, the proposed combination of Yee and Mollov fails to arrive at the claimed invention.

A.   The Rejection of Claim 1 Should be Reversed

Claim 1 recites the following limitations:

> ...at least one sensor further configured to generate an output signal representative of the detected temperature;
>
> a processing circuit configured to adjust at least one clock maintained by the time keeping function of the meter in dependence upon the output signal from the at least one sensor.

Thus, a processing circuit adjusts at least one clock in the meter in dependence upon the output signal representative of a detected temperature.

In the October 27, 2008 office action, the Examiner has admitted that Yee does not teach adjusting clock information on the basis of sensed temperature information, as per claim 1. (Final Office Action at p.4). The Examiner addresses the shortcoming of Yee with respect to the temperature-based clock adjustment by citing the teachings of Mollov. In support of this rejection, the Examiner stated that:

> It would've been obvious to one of ordinary skill in the art at the time of the invention to modify Yee et al. invention to include adjusting/varying clock/timing information in dependence on the output signal that is representative/function of temperature in order to provide an accurate time source in the event the . [sic] (Col. 9, lines 19-20).

(*Id.*) Applicants respectfully submit that the Examiner has not provided a clearly articulated reason to modify the Yee device.

In particular, there is no evidence on the record that the Yee time source has a temperature-dependent accuracy issue that would benefit from or require adjustment. The Examiner has not cited any evidence that indicates that the real-time clock of Yee suffers from inaccuracy due to temperature variation. Thus, one of ordinary skill in the art would not have a reason to "modify Yee et al. invention to include adjusting/varying clock/timing information in dependence on ... temperature in order to provide an accurate time source", as alleged by the Examiner. (See *id.*) In other words, because there is no evidence that the clock circuit of Yee has an *inaccurate* time source, there is no reason to so modify the circuit of Yee "in order to provide an accurate time source".

Moreover, even if one were to assume that the clock of Yee had some inaccuracy, there is no evidence on the record that indicates that the level of inaccuracy of Yee's clock would adversely affect the *use* of the real-time clock in Yee. In other words, nothing on the record suggests or implies that Yee requires any level of accuracy that cannot be met by the circuit disclosed in Yee. Accordingly, one of ordinary skill in the art would not have a reason to "modify Yee et al. invention to include adjusting/varying clock/timing information in dependence on ... temperature in order to provide an accurate time source."

To this end, it is noted that the only apparent use of the crystal oscillator clock in Yee is to keep time when there is a power outage. (Yee at col. 3, lines 42-52). However, no reason is given for maintaining the clock during a power outage. It is possible that the real-time clock is maintained so that the real-time clock will be "up to date" when power is eventually restored. However, there is no indication that use of the real-time clock in Yee requires the clock to have a level of accuracy not achievable using conventional means of restoring the real-time clock in a meter after a power outage.

By contrast, the inventors have implemented a device that employs a highly accurate clock for providing time-of-use metering capabilities immediately after restoration from a power outage. It was discovered by the inventors that time-of-use metering was sometimes inaccurate after a power outage, and that it was temperature variations affecting the crystal oscillator, which was used to maintain the clock during the outage, that contributed to these variations.

Yee, by contrast, does not appear to have any issues with the accuracy of its real-time clock. Yee certainly has not attributed any inaccuracies due to temperature variation. Because Yee does not appear to have any issues with the accuracy of its real-time clock, there is no reason to modify Yee to incorporate the clock adjustment capability of Mollov.

Accordingly, it is respectfully submitted that the Examiner has not provided a clearly articulated reason to modify the meter of Yee to include a means or circuit for compensating a real-time clock based on sensed temperature.

For at least this reason, this Board is requested to reverse the obviousness rejection of claim 1 over Yee and Mollov.

B.   The Rejections of Claims 2-6

Claims 2-6 depend from claim 1. Accordingly, this Board is requested to reverse the rejections of claims 2-6 over Yee and Mollov for at least the same reasons.

1.   The Rejection of Claim 4 Should Be Reversed for Additional Reasons

The rejection of claim 4 should be reversed for reasons independent of those discussed above in connection with claim 1. In particular, claim 4 recites "wherein the at

least one sensor comprises a diode." The use of a diode is an elegantly simple way to obtain a temperature measurement that is particularly useful in embodiments of the invention. The combination of Yee and Mollov proposed by the Examiner does not include a temperature sensor in the form of a diode.

In particular, the Examiner has alleged that Yee teaches at least one sensor as a diode by citing element "134" of Yee. Element "134" of Yee is a display, not a sensor. Moreover, Yee only discloses a single temperature sensor 114. Nothing in Yee describes or suggests that sensor 114 is a diode. (See Yee at col. 3, lines 18-21).

Because the proposed combination of Yee and Mollov fails to disclose a circuit "wherein the at least one [temperature] sensor comprises a diode," the rejection of claim 4 should be reversed for reasons independent of those discussed above in connection with claim 1.

Claim 5 depends from claim 4, and therefore the rejection of claim 5 should be reversed for at least the same reasons.

2.   The Rejection of Claim 6 Should Be Reversed for Additional Reasons

The rejection of claim 6 should be reversed for reasons independent of those discussed above in connection with claim 1. In particular, claim 4 recites that the processing circuit is configured to:

> generate a real time clock output pulse after receiving N timing signals; and
> change N based on the output signal from the at least one sensor.

Thus, the processing circuit operates by generating a clock pulse after receiving a predetermined total N of timing signals. In order to adjust the clock as claimed, the processing circuit changes N, or the total number of timing signals that must be received to

generate a pulse. Thus, for example, increasing N adjusts the clock "speed" downward, and decreasing N adjusts the clock "speed" upward.

The combination of Yee and Mollov proposed by the Examiner does not include a processing circuit that carries out these steps.

In particular, the Examiner has alleged that Yee teaches these capabilities of the processing circuit at col. 6, lines 43-45. The cited passages of Yee do not teach the subject limitations, nor do they teach anything related to a clock circuit. In particular, col. 6, lines 43-45 of Yee are set forth below:

> Having generated an alarm, the controller at step **209** continues to monitor the power meter temperature to determine if it ever exceeds the shut off threshold **309**. Generally, …

Nothing in these paragraphs teach any of the additional limitations of claim 6. Because the proposed combination of Yee and Mollov fails to disclose a processing circuit configured to "generate a real time clock output pulse after receiving N timing signals; and change N based on the output signal from the at least one sensor," the rejection of claim 6 should be reversed for reasons independent of those discussed above in connection with claim 1.

C.   The Rejection of Claim 7 should be Reversed

In the Rejection of claim 7, the Examiner relies on the same reasoning for modifying Yee with Mollov as that applied to claim 1. As discussed above, there is no legally sufficient reason to modify Yee with the teachings of Mollov as proposed. Accordingly, for at least the same reasons as those set forth above in connection with claim 1, it is respectfully submitted that the rejection of claim 7 should be reversed.

Claim 7 is argued separately because the rejection over Yee and Mollov should be reversed for additional reasons. As will be discussed below in detail, the proposed

combination does not arrive at the claimed invention. In particular, neither Yee nor Mollov, alone or in combination, teach or suggest a "processing circuit configured to generate metering data based on the commodity consumption information and real time clock information", as called for in claim 7. As a consequence, it is respectfully submitted that the obviousness rejection of claim 7 should be withdrawn.

In particular, claim 7 essentially recites that metering information is generated based on consumption information *and* the real-time clock. (See, e.g., specification at p.7, lines 8-13; p.22, lines 15-18). For example, time-of-use metering involves using different rates for energy consumed at different times of day, and thus requires both consumption and time information to generate the metering data. (See, e.g., specification at p.2, lines 11-18).

1.   The Rejection of Claim 7

In the rejection of claim 7, the Examiner alleged that Yee teaches determining metering data using both consumption information *and* real-time clock information, as claimed. The Examiner contended that Yee teaches this feature at col. 2, lines 28-34. (Final Office Action at p.3). The cited portion of Yee is set forth below:

> The power meter 102 measures the amount of electrical power being used by a customer. In one embodiment, the power meter 102 comprises a power disconnect switch 104, two current sensors 106, a power measurement device 108, a voltage reference 110, a controller 112, a temperature sensor 114, a photo sensor 116, a clock reference 118, and a power line carrier (PLC) interface 120. Electrical power...

(Yee at col. 2, lines 28-34). Nothing in the above-quoted paragraph teaches that *metering data* is generated based on a real-time clock. While the meter 102 of Yee does include a clock reference 118, there is nothing to indicate that the clock reference 118 is used to generate any metering data. To the contrary, as best can be discerned, the clock reference 118 of Yee *only* appears to be used in connection with determining whether to disconnect

power to the load. (*Id.* at col. 10, lines 35-59). Determining whether to disconnect a load does not involve *not* metering data.

The Examiner has also alleged that "it is well known in the art that when providing a service such as power to a customer recording the amount of time the power was consumed is common in the art." (Final Office Action at p.6). It is not clear whether this is an *inherency* argument or an *obviousness argument.* Nevertheless, the argument fails in either case.

With respect to inherency, it is not necessary that any meter that includes real-time clock must "[record] the amount of time the power was consumed". As clearly taught in col. 10, lines 35-59 of Yee, there are certainly other uses of a real-time clock in a meter. Thus, it cannot be said that any meter that has a real-time clock must necessarily "…generate metering data based on the commodity consumption information and real time clock information", as called for in claim 7.

With respect to obviousness, the Examiner has not provided any reason or motivation to modify Yee to incorporate the additional functionality. (See Final Office Action at p.6).

Because neither Yee nor Mollov teach or suggest a "processing circuit configured to generate metering data based on the commodity consumption information and real time clock information", the proposed combination does not arrive at the invention of claim 7. For at least this reason, as well as those discussed above in connection with claim 1, this Board is requested to reverse the rejection of claim 7.

D.   Claims 8-18

Claims 8-18 also stand rejected as allegedly being obvious over Yee and Mollov. Claims 8-18 all depend from and incorporate all of the limitations of claim 7. As discussed above in connection with claims 1 and 7, there is no reason to combine Yee and Mollov such that the resulting device arrives at the invention of claim 7. Moreover, even if the references were combined as proposed, they would not arrive at a device that includes a "processing circuit configured to generate metering data based on the commodity consumption information and real time clock information". For at least these reasons, it is respectfully submitted that the obviousness rejections of claims 8-18 are in error and should be reversed.

1.   Additional Reasons for the Allowance of Claims 15 and 18

Claims 15 and 18 both recite an additional sensor, and wherein the commodity consumption information is adjusted in dependence upon the output signal of the additional sensor. Thus, through the dependence on claim 7, the invention of claims 15 and 18 involve adjusting a real-time clock based on temperature sensor information, and by their own limitations, adjusting a commodity consumption signal based on other temperature sensor information.

Yee does not teach or suggest adjusting either the real-time clock *or* commodity consumption information based on a sensed temperature value. While the Examiner proposes modifying Yee to adjust a real-time clock based on temperature as taught by Mollov, the Examiner has not provided any source that teaches *adjusting commodity consumption values* based on temperature.

Nevertheless, in the rejection, the Examiner alleged that Fig. 1 of Yee taught "the processing circuit … configured to adjust the energy consumption information in dependence upon the output signal from the at least one additional temperature sensor" of claims 15 and 18. (Final Office Action at p.3). However, nothing in Fig. 1 could possibly be argued to suggest adjusting energy consumption information based on the output of a temperature sensor.

In response to such arguments, the Examiner has alleged that disconnecting the electricity meter based on a temperature exceeding a threshold constitutes "[adjusting] the energy consumption information in dependence upon the output signal from the at least one additional temperature sensor". (Final Office Action at p.7). However, disconnect the entire meter is not "adjusting energy consumption information". Indeed, the energy consumption information stays the same upon disconnect. The meter just stops recording measuring it.

Accordingly, for reasons additional to those discussed above in connection with claim 7, the proposed combination of Yee and Mollov does not arrive at the invention of claims 15 and 18. For at least these additional reasons, it is respectfully submitted that the rejections of claims 15 and 18 are in error and should be reversed.

2.   Additional Reasons for Reversing Rejections of Claims 13 and 14

The rejections of claims 13 and 14 should be reversed for the additional reasons set forth above in connection with claims 4 and 6, respectively.

E.   <u>Claims 19-20</u>

Claims 19-20 are allowable over the prior art for substantially the same reason as those set forth above in connection with claim 1.   Accordingly, claims 19 and 20 are *not argued separately from claim 1.*

(8) CONCLUSION

For all of the foregoing reasons, claims 1-20 are not unpatentable under 35 U.S.C. § 103(a). As a consequence, the Board of Appeals is respectfully requested to reverse the rejection of these claims.

Respectfully submitted,

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CLAIM APPENDIX

1. (Original)   An arrangement for adjusting a time keeping function of a utility meter, comprising:

at least one sensor configured to detect a temperature at a location proximate a time keeping component, the time keeping component generating timing signals at a rate that varies as a function of temperature, the at least one sensor further configured to generate an output signal representative of the detected temperature;

a processing circuit configured to adjust at least one clock maintained by the time keeping function of the meter in dependence upon the output signal from the at least one sensor.

2. (Original)   The arrangement of claim 1, wherein the time keeping component comprises a crystal oscillator.

3. (Original)   The arrangement of claim 1, wherein the processing circuit comprises a digital signal processor.

4. (Original)   The arrangement of claim 1, wherein the at least one sensor comprises a diode.

5. (Original)   The arrangement of claim 4, wherein the diode is coupled to the processing circuit through an analog to digital converter.

6. (Original)   The arrangement of claim 1 wherein the processing circuit is further operable to:

generate a real time clock output pulse after receiving N timing signals; and

change N based on the output signal from the at least one sensor.

7. (Previously presented)   An electricity meter comprising:

a source of commodity consumption information;

at least one sensor configured to detect a temperature at a location proximate a time keeping component, the time keeping component generating timing signals at a rate that varies as a function of temperature, the at least one sensor further configured to generate an output signal representative of the detected temperature;

a processing circuit coupled to receive commodity consumption information from the source of commodity consumption information, the processing circuit configured to generate metering data based on the commodity consumption information and real time clock information, and adjust the real time clock information in dependence upon the output signal from the at least one sensor.

8. (Original)   The utility meter of claim 7 wherein the processing circuit includes a digital signal processor.

9. (Original)   The utility meter of claim 8 wherein the processing circuit includes a microcontroller.

10. (Original) The utility meter of claim 7 wherein the processing circuit includes at least two processors.

11. (Original) The utility meter of claim 7 wherein the source of commodity consumption information comprises a source of electrical energy consumption information.

12. (Original) The arrangement of claim 7, wherein the time keeping component comprises a crystal oscillator.

13. (Original)   The arrangement of claim 7, wherein the at least one sensor comprises a diode.

14. (Original) The arrangement of claim 7 wherein the processing circuit is further operable to:

generate a real time clock output pulse after receiving N timing signals; and

change N based on the output signal from the at least one sensor.

15. (Previously presented)   The arrangement of claim 7 wherein:

the source of commodity consumption information includes a current sensing device, the current sensing device having a temperature dependent characteristic that affects the accuracy of the commodity consumption information;

the utility meter further comprises at least one additional sensor disposed proximate to the current sensing device, the at least one additional sensor configured to detect a temperature at a location proximate the current sensing device, the additional sensor further configured to generate a second output signal representative of the detected temperature; and

the processing circuit is further configured to adjust the energy consumption information in dependence upon the output signal from the at least one additional temperature sensor.

16. (Original) The utility meter of claim 7 wherein the source of commodity consumption signals further comprises:

a plurality of voltage sensors operably coupled to a plurality of power lines, the plurality of voltage sensors operable to generate analog voltage measurement signals representative of voltage waveforms on the plurality of power lines;

a plurality of current sensors operably coupled to a plurality of power lines, the plurality of current sensors operable to generate analog current measurement signals representative of current waveforms on the plurality of power lines;

at least one analog to digital converter operable to receive the analog voltage measurement signals and the analog current measurement signals and generate digital measurement signals therefrom;

a digital signal processor operably connected to receive the digital measurement signals from the at least one analog to digital converter, the digital signal processor operable to generate the energy consumption information from the digital measurement signals.

17. (Original) The utility meter of claim 16 wherein the digital signal processor further comprises at least a part of the processing circuit.

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18. (Original) The utility meter of claim 16 wherein:

the current sensing device has a temperature dependent characteristic that affects the accuracy of the analog current measurement signals;

the utility meter further comprises at least one additional sensor disposed proximate to the current sensing device, the at least one additional sensor configured to detect a temperature at a location proximate the current sensing device, the additional sensor further configured to generate a second output signal representative of the detected temperature;

the processing circuit is further configured to adjust the energy consumption information in dependence upon the output signal from the at least one additional temperature sensor.

19. (Original) A method for adjusting a time keeping function of a utility meter, comprising:

generating timing signals using a time keeping component that generates timing signals at a rate the varies as a function of temperature;

detecting a temperature at a location proximate to the time keeping component;

generating an output signal representative of the detected temperature; and

adjusting at least one clock maintained by the time keeping function of the meter in dependence upon the output signal.

20. (Original) The method of claim 19, wherein the time keeping component comprises a crystal oscillator.

EVIDENCE APPENDIX

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[NONE]

RELATED PROCEEDINGS APPENDIX

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[NONE]